INDEX

SOVIET ATOMIC ENERGY

Volumes 14 and 15, 1963

SOVIET ATOMIC ENERGY

Vols. 14 and 15, 1963

A translation of Atomnaya Énergiya

A

Abagyan, L. P. - 612
Abramov, A. I. - 1276
Adamov, V. M. - 1039
Adamovich, V. K. - 1194
Afonon, I. P. - 133
Agapova, N. I. - 1007
Ageev, E. P. - 518
Agranovich, V. M. - 1140
Akhachinskii, V. V. - 1082
Akhundov, A. A. - 422
Akhundov, T. S. - 609
Akimov, G. V. - 382
Alekseev, A. G. - 1342
Alekseev, N. V. - 722
Alikhanov, S. G. - 127
Alkhazashvili, G. M. - 1031
Alkhazov, I. D. - 851, 955
Altunin, V. V. - 912
Andreev, V. D. - 763
Anosov, V. V. - 928
Arifkhanov, U. R. - 722
Arkhangel'skii, Yu. - 1215
Artemov, K. P. - 499
Avaev, V. N. - 671, 675

B

Baiborodov, Yu. T. - 459
Bakaev, I. I. - 655
Balabanov, V. I. - 1197
Balebanov, V. M. - 1036, 1162
Bal'vas, Yu. P. - 1069
Basin, Ya. N. - 1069
Basmanov, P. I. - 935
Begzhanov, R. V. - 511
Belanova, T. S. - 175, 1276
Belkin, V. F. - 275, 1121
Belov, L. M. - 955
Belovintsev, K. A. - 364, 720
Belyaev, L. I. - 974
Belyaev, V. - 438
Belyak, A. Ya. - 364, 720
Berezin, A. K. - 245
Berezina, G. P. - 245
Bezbatchenko, A. L. - 462
Biryukov, V. - 528, 1332
Blagovolin, P. P. - 627
Blokhintsev, D. I. - 97
Blyumkina, Yu. A. - 725
Bochagov, B. A. - 891
Bochkarev, V. - 982
Bochvar, I. A. - 704
Bogacheva, E. K. - 678
Bogolyubov, N. N. - 457
Bohr, A. - 36
Bolotin, L. I. - 245
Bol'shov, V. I. - 1177
Bondarenko, I. I. - 725
Borishanskii, V. M. - 318, 614
Breger, A. Kh. - 1018
Brevnov, N. N. - 359
Brevnova, N. V. - 616
Brezhnev, N. E. - 970
Brezhneva, N. E. - 678, 820, 922
Brikker, I. N. - 741
Broder, D. L. - 1113
Bulanov, L. A. - 325, 578
Burchenko, P. Ya. - 353

C

Chel'tsova, M. A. - 578
Cheremnykh, P. A. - 133
Cherenkov, P. A. - 364, 720
Chernoplekov, N. A. - 215, 252
Chernyaev, I. I. - 389
Chernyshov, A. A. - 1271
Chuburkova, I. I. - 1047
Chulkov, P. M. - 593
Cockcroft, Sir John - 59

D

Danchev, V. I. - 291
Danelyan, L. S. - 258
Davidenko, V. A. - 92
Davidovskii, V. G. - 717
Davydov, V. V. - 722
Degal'tsev, Yu. G. - 968
Dmitriev, M. T. - 709
Dmitriev, V. N. - 599, 659
Dmitrievskii, V. P. - 906
Dobromyslov, V. A. - 1303
Doil'nitsyn, E. Ya. - 963
Donets, E. D. - 14
Dorofeev, G. A. - 902
Doroshenko, G. G. - 895
Drapchinskii, L. V. - 599
Drozdov, V. E. - 1018
Druin, V. A. - 14
Dubovskii, B. G. - 1266
Dubrovskaya, G. D. - 1191
Dubrovskii, I. Ya. - 855
Dulin, V. A. - 411, 508
D'yachenko, P. P. - 950
Dzhelepov, V. P. - 22, 906

E

Efanov, A. I. - 1060
Efimenko, B. A. - 895
Efimov, B. V. - 258
Egorov, B. N. - 430
Egorov, E. V. - 217
Egorov, Yu. A. - 671, 675
El'tekov, V. A. - 1127
Eliseev, V. S. - 413
Ellert, G. V. - 389
Eremin, A. A. - 820, 922, 970
Ermakov, S. M. - 960
Eroshov, M. E. - 1018
Evseeva, L. S. - 492

F

Fadeev, V. I. - 891
Fadeeva, V. I. - 582
Fainberg, Ya. B. - 245, 353
Fényvésy, E. - 1090
Filippov, V. V. - 1281
Filov, R. A. - 601
Firsova, E. V. - 614
Fischer, E. - 1206
Flerov, G. N. - 14
Fokin, L. R. - 1007
Frolov, V. V. - 1336

G

Galanin, A. D. - 791
Galeev, A. A. - 1229
Galishev, V. S. - 469
Garbalyauskas, Ch. A. - 972, 1072
Garusov, E. A. - 736
Gavrilov, B. I. - 133
Gavrilov, P. A. - 802
Gedeonov, L. I. - 974
Gladyshev, D. A. - 511
Glasko, V. B. - 1036, 1162
Glazkov, A. A. - 220
Glazkov, N. P. - 405, 1173
Glazkov, Yu. Yu. - 1266
Glazov, A. A. - 906
Gol'dberg, V. Z. - 499
Gol'din, M. L. - 1308
Golenko, D. I. - 1127
Golobanov, Yu. N. - 820
Golovanov, Yu. N. - 922, 970
Golubev, V. I. - 1053
Goncharov, V. V. - 7
Gorbunov, E. P. - 1105
Gorbunov, V. F. - 593
Gordeeva, L. D. - 562, 1177
Gorn, L. S. - 418
Gorshkov, G. V. - 567, 573
Govorkov, B. B. - 1202
Grebennikov, R. V. - 285
Grecov, D. - 744
Gridasov, V. I. - 720
Gritchenko, Z. G. - 974
Gromov, A. M. - 364
Gromov, V. V. - 513
Groshev, A. L. - 1036, 1162
Gruzin, P. L. - 867

H

Hartman, W. - 224

I

Ibragimov, M. Kh. - 426
Ibragimov, Sh. Sh. - 482, 685
Ilincev, George - 382
Ilyasova, G. A. - 1266
Ioffe, M. S. - 459
Ionaitis, P. P. - 862
Ispravnikova, V. V. - 280
Ivanenko, V. V. - 1188
Ivanov, K. E. - 492
Ivanov, R. B. - 1043
Ivanov, V. I. - 536
Ivashchenko, N. I. - 318
Izrael', Yu. A. - 313

K

Kaminskii, V. A. - 617
Kapchigashev, S. P. - 808
Kaplan, E. P. - 325, 578
Kaplunov, M. Ya. - 217
Karabekov, I. P. - 1249
Karavaev, G. N. - 747
Karmanov, F. V. - 133
Karpov, V. L. - 1018
Kartashov, N. V. - 551
Karumidze, G. S. - 422
Katkovskaya, K. A. - 855
Katykhin, G. S. - 516
Kazachkovskii, O. D. - 175
Kazanskii, G. S. - 143
Kazanskii, Yu. A. - 411, 508
Keirim-Markus, I. B. - 704, 1132
Khaidarov, T. - 511
Kharchenko, I. F. - 309
Kharlamov, A. G. - 1313
Khazanov, B. I. - 418, 525
Kholin, S. A. - 846
Khorasanov, G. L. - 127
Kimel', L. R. - 311, 603, 1055
Kirichenko, V. N. - 935
Kirilyuk, A. L. - 952
Kitaev, G. I. - 205
Klyucharev, A. P. - 43
Kochetkov, V. I. - 492
Kochetov, B. I. - 408
Kochurov, B. P. - 275, 791, 1121
Kogan, B. I. - 636
Kolesov, B. M. - 521
Kolesov, V. F. - 267
Kol'ga, V. V. - 906
Kolodin, G. N. - 1188
Kolosov, I. V. - 1182
Kolosova, I. F. - 1182
Kolychev, B. S. - 874
Komar, A. P. - 891
Komochkov, M. M. - 815, 1049
Konstantinov, L. V. - 408, 1060
Kontrat'ko, M. Ya. - 849
Korda, Yu. S. - 316
Korneev, V. T. - 1132
Koroleva, V. P. - 1276
Korotkov, V. - 774
Korpusov, G. V. - 678, 828
Kostritsa, A. A. - 212
Kotov, V. I. - 1326
Kovalenko, S. S. - 1039
Kovalenko, V. K. - 842
Kovalev, I. - 1215
Kovalevskii, A. L. - 1197
Kozhevnikov, D. A. - 556
Kozlov, V. F. - 434, 842
Kozlov, V. I. - 1266
Kramer-Ageev, E. A. - 853
Krasavtseva, G. M. - 422
Kremnev, V. A. - 209
Krivokhtskii, A. S. - 851, 955, 1043
Krizhanskii, L. M. - 1043
Kropin, A. A. - 906
Kruglov, A. S. - 685
Kudryashov, V. G. - 482
Kukharenko, N. K. - 1069
Kulish, E. E. - 1303
Kumekin, Yu. P. - 33
Kurtenov, M. M. - 692
Kushniruk, V. F. - 1047
Kutsaeva, L. S. - 950
Kuz'michev, Yu. S. - 750
Kuz'mina, L. N. - 1031
Kuz'minov, B. D. - 950
Kuznetsov, A. B. - 143
Kuznetsov, V. F. - 725
Kuznetsov, V. V. - 462, 1036, 1162

L

Laletin, N. I. - 474
Lapostol, P. - 1078
Lavrenchik, V. N. - 304, 593
Lazurkin, Yu. S. - 332
Lazutkin, E. S. - 442
Lebedev, A. I. - 1202
Lebedev, R. - 528, 1332
Lehnert, B. - 72
Leipunskii, O. I. - 603
Leksin, G. A. - 870
Leongardt, A. D. - 747
Leschinskii, N. I. - 985
Levin, V. I. - 678, 828
Levochkin, F. K. - 1297
Likhtman, V. I. - 1321
Lisochkin, G. A. - 729
Lisov, G. N. - 1018
Lomakin, S. S. - 968
Lozhkin, O. V. - 870
Luk'yanov, A. A. - 209
Luk'yanychev, Yu. A. - 1184
Lupakov, I. S. - 750
Luyanas, V. I. - 1072
Lyubavin, Yu. P. - 521

M

Makhlis, F. A. - 1300
Makhon'ko, K. P. - 942
Maksimov, G. P. - 133
Maksimova, A. M. - 974
Maksyumenko, B. P. - 848

Maksyutenko, B. P. - 1042
Malakhov, N. P. - 462
Malakhov, S. G. - 942
Malkin, L. Z. - 851, 955
Man'ko, N. M. - 678, 828
Markelov, V. V. - 1132
Martynova, O. I. - 855, 917
Mashkovich, V. P. - 853
Matulevichus, V. P. - 972
Matulis, A. I. - 359
Matulyavichus, V. P. - 1072
Matusevich, E. S. - 1287
Medonos, S. - 760
Meerson, G. A. - 586
Melent'ev, B. N. - 1188
Meshcheryakov, M. G. - 33
Mikhailenko, I. E. - 1318
Mikhailov, A. I. - 143
Mikhlin, E. Ya. - 1140
Mingulina, É. I. - 855
Mirolyubov, E. N. - 692
Mirzoyan, A. R. - 741
Mogil'ner, A. I. - 664
Moiseev, S. S. - 1229
Mordovskaya, G. S. - 902
Moroz, E. M. - 364
Mottelson, B. R. - 36

N

Nazarov, N. I. - 655
Nazvanova, V. A. - 636
Nedovesov, V. G. - 1043
Nedvetskaite, T. N. - 1072
Nefedov, O. M. - 325, 578
Nemets, O. F. - 149
Nesmeyanov, A. N. - 979
Nesmeyanova, G. M. - 1031
Nesterov, V. G. - 725
Nichkov, I. F. - 1066
Nikeshichev, V. N. - 630
Nikitin, M. K. - 516
Nikolaev, M. N. - 1053, 1281
Nikolaev, N. S. - 753, 1184
Nikotin, O. P. - 849
Nomofilov, E. V. - 426
Nosov, V. I. - 737
Novikov, A. G. - 963
Nurushev, S. B. - 33

O

Ogorodnikov, B. I. - 935
Okolovich, V. N. - 725, 956, 1177
Olesov, Yu. G. - 586
Onishchenko, L. M. - 906
Oparin, E. M. - 1165
Orlov, M. Yu. - 1053
Orlov, Yu. V. - 671, 675
Osanov, D. P. - 1059
Osetinskii, G. M. - 1075
Osovets, S. M. - 997
Ot-Stavnov, P. S. - 506
Ovchinnikov, A. K. - 521
Oziraner, S. N. - 820, 922, 970

P

Pamfilova, L. A. - 1188
Panchenko, A. M. - 416, 603, 1055
Panchenkov, G. M. - 518
Pankrat'ev, Yu. V. - 671, 675
Pankratov, V. M. - 161, 167
Pargal, A. M. - 836
Pasechnik, M. V. - 149
Paskar', B. L. - 1007
Patrusheva, E. N. - 828
Patskevich, V. M. - 329, 628
Patyanin, S. I. - 114
Perfilov, N. A. - 601
Petrov, A. D. - 578
Petrov, É. E. - 960
Petrov, V. I. - 902
Petrov, V. M. - 459
Petrov, Yu. V. - 736
Petryanov, I. V. - 935
Petrzhak, D. A. - 955
Petrzhak, K. A. - 599, 659, 849, 851, 1025, 1039
Pimenov, M. I. - 902
Pirogova, G. N. - 1318
Pistunovich, V. I. - 63
Plakhov, A. G. - 133
Platnov, G. F. - 828
Polikanov, S. M. - 442, 1201
Polikarpov, V. I. - 616
Polyakov, L. - 758
Ponomarev-Stepanoi, N. N. - 968
Popkov, K. K. - 1113, 1311
Popov, Slavcho - 432
Popov, V. I. - 213
Popov, V. T. - 422
Popov, Yu. P. - 808
Portnoi, K. I. - 582
Postnikov, V. V. - 1060
Potsyus, V. Yu. - 972
Pozdnyakov, A. A. - 1339
Prokhorova, N. P. - 828
Prosina, T. I. - 704
Pryalochnikov, V. I. - 586
Pucherov, N. N. - 149

R

Rakovskii, É. V. - 1339
Rasponin, S. P. - 1066
Razumova, K. A. - 1105
Regel', A. R. - 114
Remaev, V. V. - 316
Reva, N. I. - 353
Rivkin, S. L. - 430, 609
Rodicheva, G. V. - 401
Romanov, G. A. - 865
Romanov, Yu. F. - 599, 659
Rovinskii, F. Ya. - 280, 327
Rubin, N. B. - 143
Rudakov, V. P. - 499, 754
Rudnev, N. I. - 353.
Rumyantsev, G. Ya. - 377
Rumyantsev, S. V. - 1303
Ryabukhin, Yu. S. - 1325
Ryndina, É. Z. - 1047

S

Sadikov, I. P. - 1271
Sagdeev, R. Z. - 1229
Samoilov, L. N. - 593, 722
Samsonov, G. V. - 620, 1191
Saukov, A. I. - 1165
Saul'ev, V. K. - 190
Sazonov, A. M. - 1179
Scserbak, K. - 1090
Sedletskii, R. V. - 1025
Seliverstov, B. N. - 802
Semashko, N. N. - 462, 1036, 1162
Semenikhin, A. N. - 867
Semenov, L. P. - 1140, 1155
Sereda, G. A. - 327
Sergachev, A. I. - 950
Sevast'yanov, Yu. G. - 325, 578
Shabalina, L. A. - 836
Shamashov, F. P. - 285
Shapar', A. V. - 1045
Shapkin, V. V. - 133
Sharapov, V. N. - 1266
Sherman, L. E. - 1170
Shevelev, Ya. V. - 190, 369
Shishkov, Yu. D. - 753
Shkoda-Ul'yanov, V. A. - 836
Shlykov, Yu. P. - 747
Shopauskas, K. K. - 972
Shtan', A. S. - 1303
Shubko, V. M. - 304
Shugar, I. V. - 411, 508
Shuvalov, R. S. - 1165
Shvabe, E. - 906

Shvedov, O. V. - 275, 1121
Shvedov, V. P. - 974
Sinitsyn, R. V. - 630
Sirvidas, V. I. - 1179
Sivintsev, Yu. V. - 226, 634, 842
Sizov, I. V. - 534
Smelov, V. V. - 1266
Smirenkin, G. N. - 562, 725, 956, 1177
Smirnov-Averin, A. P. - 325, 578
Smirnov, V. N. - 1063
Smirnov, Yu. I. - 842
Smorodinskii, Ya. A. - 102
Sobolev, R. I. - 459
Sofiev, G. N. - 304
Sokolov, Yu. Ya. - 1297
Solov'ev, S. M. - 1047
Solov'eva, Z. I. - 601
Sotov, V. L. - 922
Spitsyn, Vikt. I. - 513, 1316, 1318
Stakhanov, I. P. - 963
Starodubtsev, S. V. - 511
Stavisskii, Yu. Ya. - 1045, 1170, 1276
Stepanov, A. S. - 963
Stepanova, G. G. - 1316
Stoenko, S. G. - 1018
Stoletov, G. D. - 33
Strutinskii, V. M. - 161
Styrikovich, M. A. - 855, 917
Styro, B. I. - 972, 1072
Subbotin, V. I. - 426
Sukhomlin, E. A. - 353
Suprunenko, V. A. - 353
Suvorov, A. D. - 836
Sveshnikov, A. G. - 1036, 1162
Sychev, B. S. - 1049
Syritskaya, Z. M. - 704
Syrkus, N. P. - 1018
Syshchikov, L. A. - 482

T

Tabolina, L. N. - 1311
Tananaev, I. V. - 401
Taraban'ko, V. A. - 1271
Taran, Yu. V. - 1168
Teplykh, V. F. - 849
Terent'ev, B. M. - 1127
Terent'ev, V. P. - 1055
Timofeeva, N. I. - 582
Timoshenko, N. I. - 912
Timoshevskii, G. F. - 316
Tokareva, D. V. - 1063
Tolok, V. T. - 353, 655
Tolstikov, V. A. - 1170
Tomkus, I. S. - 1072
Torchenkova, E. A. - 1316
Torgovitskii, D. M. - 1018
Troitskii, O. A. - 1321
Trusova, V. P. - 1325
Tsarenko, A. F. - 1066
Tsarenkov, A. P. - 143
Tsvetkov, O. S. - 567, 573
Tsvetkova, S. A. - 1311
Tsykanov, V. A. - 321, 486
Tsypin, S. G. - 1287
Tugarinov, A. I. - 755
Tyukaev, Yu. V. - 1069

U

Ukrainskii, A. M. - 655
Usachev, L. N. - 1255
Uspenskii, L. N. - 1132
Utyuzhnikov, A. N. - 950

V

Vainshtein, B. I. - 1018
Val'dner, O. A. - 220
Val'ter, A. K. - 43
Van'kov, A. A. - 1276
Vara, K. - 1090
Vartanova, L. I. - 616
Vasil'ev, G. A. - 671, 675
Vasil'ev, R. D. - 902
Vasil'eva, A. A. - 704
Vdovenko, V. M. - 865
Velikhov, E. P. - 597
Vel'tishcheva, N. S. - 593
Venikov, N. I. - 551
Vertebnyi, V. P. - 952
Veselkin, A. P. - 671, 675
Vlasov, M. F. - 952
Vlasov, N. A. - 40, 722
Volkov, B. I. - 1162
Volkov, E. D. - 353
Vorb'ev, V. A. - 732
Voronin, I. M. - 482, 685
Vukalovich, M. P. - 912

Y

Yablokov, B. N. - 1326
Yakovleva, G. V. - 974
Yakubik, V. V. - 704
Yakubovich, A. L. - 928
Yakubovich, I. A. - 198
Yakunin, M. I. - 1043
Yuzvuk, N. N. - 616

Z

Zablotskaya, T. V. - 318
Zaitsev, E. I. - 928
Zakharov, V. E. - 127
Zakharov, Yu. V. - 750
Zalesskii, Yu. G. - 655
Zamolodchikov, B. I. - 906
Zavoiskii, E. K. - 51, 133
Zavoiskii, V. K. - 605, 859
Zel'dovich, Ya. B. - 83
Zemlyanov, M. G. - 252
Zhezherun, I. F. - 183, 1271, 1294
Zolotukhin, V. G. - 664, 895, 960
Zomov, V. L. - 970
Zotov, V. L. - 820
Zvonarev, A. V. - 1053
Zyabkin, V. A. - 567

ATOMNAYA ÉNERGIYA
EDITORIAL BOARD

A. I. Alikhanov
A. A. Bochvar
N. A. Dollezhal'
K. E. Erglis
V. S. Fursov
I. N. Golovin
V. F. Kalinin
N. A. Kolokol'tsov
(Assistant Editor)
A. K. Krasin
I. F. Kvartskhava
A. V. Lebedinskii
A. I. Leipunskii
M. G. Meshcheryakov
M. D. Millionshchikov
(Editor-in-Chief)
I. I. Novikov
V. B. Shevchenko
A. P. Vinogradov
N. A. Vlasov
(Assistant Editor)
M. V. Yakutovich
A. P. Zefirov

SOVIET ATOMIC ENERGY

A translation of **ATOMNAYA ÉNERGIYA**
A publication of the Academy of Sciences of the USSR

© 1963 CONSULTANTS BUREAU ENTERPRISES, INC.
227 West 17th Street, New York 11, N. Y.

Vol. 14, No. 1 December, 1963

CONTENTS

	PAGE ENG.	PAGE RUSS.
Editor's Note	1	3
Igor' Vasil'evich Kurchatov - I. K. Kikoin	3	5
I. V. Kurchatov and Nuclear Reactors - V. V. Goncharov	7	10
Spontaneous Fission and Synthesis of Far Transuranium Elements - G. N. Flerov, E. D. Donets, and V. A. Druin	14	18
Investigation of Properties of μ-Mesic Atoms and μ-Mesic Molecules of Hydrogen and Deuterium at the Dubna 680-MeV Synchrocyclotron - V. P. Dzhelepov	22	27
Longitudinally Polarized Proton Beam in the Six-Meter Synchrocyclotron - M. G. Meshcheryakov, Yu. P. Kumekin, S. B. Nurushev, and G. D. Stoletov	33	38
On the Theory of Rotational Spectra - A. Bohr and B. R. Mottelson	36	41
On Delayed Protons - N. A. Vlasov	40	45
The Isotope Effect in Elastic Scattering of Protons on Nuclei - A. K. Val'ter and A. P. Klyucharev	43	48
Collective Interactions and the Production of a High-Temperature Plasma - E. K. Zavoiskii	51	57
British Research in Controlled Thermonuclear Fusion - Sir John Cockcroft	59	66
Cyclotron Instability in Ogra - V. I. Pistunovich	63	72
Screw and Flute Instabilities in a Low-Pressure Plasma - B. Lehnert	72	82
The Initial Stages of the Evolution of the Universe - Ya. B. Zel'dovich	83	92
The Age of Nuclei and the Nuclear Synthesis Time - V. A. Davidenko	92	100
Causality in Present-Day Field Theory - D. I. Blokhintsev	97	105
Lobachevskian Kinematics and Geometry - Ya. A. Smorodinskii	102	110
Electrokinetic Effects in Liquid Mercury - A. R. Regel' and S. I. Patyanin	114	122
BIBLIOGRAPHY		
Bibliography of the Published Works of Academician I. V. Kurchatov	120	128

Annual Subscription: $95 **Single Issue: $30** **Single Article: $15**

All rights reserved. No article contained herein may be reproduced for any purpose whatsoever without permission of the publisher. Permission may be obtained from Consultants Bureau Enterprises, Inc., 227 West 17th Street, New York City, United States of America.

ATOMNAYA ÉNERGIYA
EDITORIAL BOARD

A. I. Alikhanov
A. A. Bochvar
N. A. Dollezhal'
K. E. Erglis
V. S. Fursov
I. N. Golovin
V. F. Kalinin
N. A. Kolokol'tsov
(Assistant Editor)
A. K. Krasin
I. F. Kvartskhava
A. V. Lebedinskii
A. I. Leipunskii
M. G. Meshcheryakov
M. D. Millionshchikov
(Editor-in-Chief)
I. I. Novikov
V. B. Shevchenko
A. P. Vinogradov
N. A. Vlasov
(Assistant Editor)
M. V. Yakutovich
A. P. Zefirov

SOVIET ATOMIC ENERGY

A translation of **ATOMNAYA ÉNERGIYA**
A publication of the Academy of Sciences of the USSR

© 1963 CONSULTANTS BUREAU ENTERPRISES, INC.
227 West 17th Street, New York 11, N. Y.

Vol. 14, No. 2 December, 1963

CONTENTS

	PAGE ENG.	PAGE RUSS.
Diffusion of a Plasma in a Magnetic Field Due to Collisions—S. G. Alikhanov, V. E. Zakharov, and G. L. Khorasanov	127	137
The Experimental Plasma Device S-1 with Helical Magnetic Fields (Stellarator)—I. P. Afonon, B. I. Gavrilov, E. K. Zavoiskii, F. V. Karmanov, G. P. Maksimov, A. G. Plakhov, P. A. Cheremnykh, and V. V. Shapkin	133	143
To the Memory of Natan Aronovich Yavlinskii	140	151
Use of Induction Electrodes to Form a Beam of Accelerated Particles in the Synchrophasotron—G. S. Kazanskii, A. B. Kuznetsov, A. I. Mikhailov, N. B. Rubin, and A. P. Tsarenkov	143	153
Study of Nuclear Reactions on the Cyclotron of the Institute of Physics, Academy of Sciences, UkrSSR—O. F. Nemets, M. V. Pasechnik and N. N. Pucherov	149	159
Possibility of the Study of Fission at a Fixed Compound-Nucleus Excitation Energy—V. M. Pankratov and V. M. Strutinskii	161	171
Fission Cross Sections of Th^{232}, U^{233}, U^{235}, Np^{237}, U^{238} for 5-37 MeV Neutrons—V. M. Pankratov	167	177
The Effect of an Even Nucleon Number on the Magnitude of the Radiation Capture Cross Section—T. S. Belanova and O. D. Kazachkovskii	175	185
A Study of Neutron Diffusion in Sintered Beryllium Oxide by a Pulse Method—I. F. Zhezherun	183	193
Certain Aspects of the Application of the Diffusion Two-Dimensional Two-Group Program—Ya. V. Shevelev and V. K. Saul'ev	190	200
Decantation Processes in the Hydrometallurgy of Uranium—I. A. Yakubovich	198	206
LETTERS TO THE EDITOR		
Comparison of Cascade Generator Circuits—G. I. Kitaev	205	213
Space Distribution of Neutron Resonance Absorption in a Block—V. A. Kremnev and A. A. Luk'yanov	209	216
Neutron Diffusion in A Moving Medium—A. A. Kostritsa	212	218
Simulation of Extended γ-Ray Sources—V. I. Popov	213	219
NEWS OF SCIENCE AND TECHNOLOGY		
Second International Symposium on Inelastic Scattering of Neutrons by Solids and Liquids—N. A. Chernoplekov	215	221
Moscow Conference on Radiation Chemistry Applications of Charged-Particle Accelerators—E. V. Egorov and M. Ya. Kaplunov	217	222
Development of Industrial Linear Accelerators—O. A. Val'dner and A. A. Glazkov	220	224
[Isotope Center at Ispra in Varase		226]

Annual Subscription: $95 **Single Issue: $30** **Single Article: $15**

All rights reserved. No article contained herein may be reproduced for any purpose whatsoever without permission of the publisher. Permission may be obtained from Consultants Bureau Enterprises, Inc., 227 West 17th Street, New York City, United States of America.

CONTENTS (continued)

	PAGE ENG.	PAGE RUSS.
[New Uranium Ore Processing Plant in USA		229]
A New Line of Vakutronik Equipment (East Germany) – W. Hartman	224	232
Results of Personnel Monitoring in Poland – Yu. V. Sivintsev	226	234
Brief Communications	227	234
BIBLIOGRAPHY		
New Literature	228	236
Articles from the Periodical Literature	230	237

NOTE

The Table of Contents lists all materials that appear in Atomnaya Énergiya. Those items that originated in the English language are not included in the translation and are shown enclosed in brackets. Whenever possible, the English-language source containing the omitted reports will be given.

Consultants Bureau Enterprises, Inc.

ATOMNAYA ÉNERGIYA
EDITORIAL BOARD

A. I. Alikhanov
A. A. Bochvar
N. A. Dollezhal'
K. E. Erglis
V. S. Fursov
I. N. Golovin
V. F. Kalinin
N. A. Kolokol'tsov
(Assistant Editor)
A. K. Krasin
I. F. Kvartskhava
A. V. Lebedinskii
A. I. Leipunskii
M. G. Meshcheryakov
M. D. Millionshchikov
(Editor-in-Chief)
I. I. Novikov
V. B. Shevchenko
A. P. Vinogradov
N. A. Vlasov
(Assistant Editor)
M. V. Yakutovich
A. P. Zefirov

SOVIET ATOMIC ENERGY

A translation of **ATOMNAYA ÉNERGIYA**

A publication of the Academy of Sciences of the USSR

© 1964 CONSULTANTS BUREAU ENTERPRISES, INC.
227 West 17th Street, New York 11, N. Y.

Vol. 14, No. 3 January, 1964

CONTENTS

	PAGE ENG.	PAGE RUSS.
Academician A. P. Aleksandrov	243	I & II
The Interaction of High-Current Pulse Beams with Plasma in a Magnetic Field — A. K. Berezin, G. P. Berezina, L. I. Bolotin, and Ya. B. Fainberg	245	249
Inelastic Scattering of Cold Neutrons by Various Materials Containing Hydrogen — M. G. Zemlyanov and N. A. Chernoplekov	252	257
Radiative Capture Cross Sections of Tellurium Isotopes as a Function of Neutron Energies Up to 1.5 keV — L. S. Danelyan and B. V. Efimov	258	264
On the Dynamics of a Spherically Symmetric Pulsed Fast Reactor — V. F. Kolesov	267	273
Determination of the External Slug Effect in Multiplying Systems with a Heavy Water Moderator — V. F. Belkin, O. V. Shvedov, and B. P. Kochurov	275	281
Determination of Sr^{90} and Ce^{144} in Samples by Extraction — F. Ya. Rovinskii and V. V. Ispravnikova	280	285
Mechanical Properties and Corrosion Resistance of Hafnium-Zirconium Alloys in a Steam-Water Medium — R. V. Grebennikov and F. P. Shamashov	285	290
The Conditions of Formation and Classification of Exogenous Uranium Deposits — V. I. Danchev	291	296
Radioactive Contamination of the Air above the Indian and Pacific Oceans during 1959-1960 — V. N. Lavrenchik, G. N. Sofiev, and V. M. Shubko	304	309
LETTERS TO THE EDITOR		
Coherent Interaction between an Electron Beam and Plasma — I. F. Kharchenko	309	314
Determination of the Accumulation Factor in Barrier Geometry — L. R. Kimel'	311	315
Calculation of the Dose Rate Inside a Spherical Source with a Normal Distribution of the γ-Radiator — Yu. A. Izrael'	313	317
Photoefficiency of NaI(Tl) Crystals in the Case of Uncollimated γ-Radiation — Yu. S. Korda, G. F. Timoshevskii, and V. V. Remaev	316	319
Heat Transfer to Molten Metals during Flow in Pipes — V. M. Borishanskii, T. V. Zablotskaya, and N. I. Ivashchenko	318	320
Thermal Stresses and Strains in a Long Bar with Uneven Internal Heat Liberation — V. A. Tsykanov	321	322

(continued)

Annual Subscription: $95 **Single Issue: $30** **Single Article: $15**

All rights reserved. No article contained herein may be reproduced for any purpose whatsoever without permission of the publisher. Permission may be obtained from Consultants Bureau Enterprises, Inc., 227 West 17th Street, New York City, United States of America.

CONTENTS (continued)

	PAGE ENG.	PAGE RUSS.
An Activation Method for the Quantitative Determination of Impurities of Organically Combined Sulfur in Polyphenyls – Yu. G. Sevast'yanov, L. A. Bulanov, E. P. Kaplan, O. M. Nefedov, and A. P. Smirnov-Averin	325	324
The Displacement of Radioactive Equilibrium between Sr^{90} and Y^{90} in Lake Water – G. A. Sereda and F. Ya. Rovinskii	327	326
NEWS OF SCIENCE AND TECHNOLOGY		
Tashkent Activation Analysis Conference – V. M. Patskevich	329	328
Symposium on Molecular Mechanisms in the Biological Effects of Ionizing Radiations – Yu. S. Lazurkin	332	330
Nuclear Research in Norway – A. A.	335	332
Commissioning of a Synchrotron at the Tokyo Nuclear Research Institute – B. Ya.	338	335
Brief Communications	340	336
BIBLIOGRAPHY		
New Literature	341	337

ATOMNAYA ÉNERGIYA
EDITORIAL BOARD

A. I. Alikhanov
A. A. Bochvar
N. A. Dollezhal'
K. E. Erglis
V. S. Fursov
I. N. Golovin
V. F. Kalinin
N. A. Kolokol'tsov
(Assistant Editor)
A. K. Krasin
I. F. Kvartskhava
A. V. Lebedinskii
A. I. Leipunskii
M. G. Meshcheryakov
M. D. Millionshchikov
(Editor-in-Chief)
I. I. Novikov
V. B. Shevchenko
A. P. Vinogradov
N. A. Vlasov
(Assistant Editor)
M. V. Yakutovich
A. P. Zefirov

SOVIET ATOMIC ENERGY

A translation of **ATOMNAYA ÉNERGIYA**
A publication of the Academy of Sciences of the USSR

© 1964 CONSULTANTS BUREAU ENTERPRISES, INC.
227 West 17th Street, New York 11, N. Y.

Vol. 14, No. 4 February, 1964

CONTENTS

	PAGE ENG.	PAGE RUSS.
Investigation of Electromagnetic Radiation from a Straight High-Current Discharge —V. A. Suprunenko, Ya. B. Fainberg, V. T. Tolok, E. A. Sukhomlin, N. I. Reva, P. Ya. Burchenko, N. I. Rudnev, and E. D. Volkov	353	349
Mikhail Aleksandrovich Leontovich	357	353
Passage of a Plasma Burst Through a Magnetic Mirror Machine—N. N. Brevnov and A. I. Matulis	359	354
6.5 MeV Microtron for Electron Injection in a Synchrotron—K. A. Belovintsev, A. Ya. Belyak, A. M. Gromov, E. M. Moroz, and P. A. Chereknov	364	359
Effect of Single Channels and Slits on Reactivity—Ya. V. Shevelev	369	364
Boundary Conditions for the Solution of Boltzmann's Equation in Periodic Lattices —G. Ya. Rumyantsev	377	371
Corrosion Resistance of Stainless Chrome-Nickel Steels in Sodium As a Function of Its Oxygen Content—G. V. Akimov	382	375
Complexing Reactions in Uranium Chemical Technology—I. I. Chernyaev and G. V. Ellert	389	383
An Investigation of the Reaction of $UO_2(NO_3)_2$ with Na_2HPO_4 in Aqueous Solution —I. V. Tananaev and G. V. Rodicheva	401	395
Spectra and Inelastic Scattering Cross Sections of Neutrons in the 0.2-1.2 MeV Energy Range Scattered by Nuclei of V, Th, Hg, W, Sb, Cd, Mo, Nb, Fe—N. P. Glazkov	405	400
A Method for Calculating the Neutron Flux in a Shut-Down Reactor with A Photoneutron Source—L. V. Konstantinov and B. I. Kochetov	408	402
The Energy Distribution of Scattered Neutrons in Water—V. A. Dulin, Yu. A. Kazanskii, and I. V. Shugar	411	404
The Bremsstrahlung Radiation of β-Particles and Shielding Against It—V. S. Eliseev	413	405
Certain Dosimetric Characteristics of the SBM-10 Small-Size Counter—A. M. Panchenko	416	408
Determination of the Content of α-Radiators Whose Energies are Close to Each Other in Isotope Mixtures—L. S. Gorn and B. I. Khazanov	418	409
Device for Radiation-Chemical Investigations in the Channel of the IRT-2000 Reactor —A. A. Akhundov, G. S. Karumidze, G. M. Krasavtseva, and V. T. Popov	422	412
Determination of the Relationship Between the Coefficients of the Turbulent Transfer of Heat and Momentum—V. I. Subbotin, M. Kh. Ibragimov, and E. V. Nomofilov	426	414
Specific Heat of Heavy Water at High Temperatures and Pressures—S. L. Rivkin and B. N. Egorov	430	416
New Type of Nomograms for γ-Flaw Detection—Slavcho Popov	432	418
Photographic Health Monitoring with Respect to β- and γ-Irradiation—V. F. Kozlov	434	419

(continued)

Annual Subscription: $95 **Single Issue: $30** **Single Article: $15**

All rights reserved. No article contained herein may be reproduced for any purpose whatsoever without permission of the publisher. Permission may be obtained from Consultants Bureau Enterprises, Inc., 227 West 17th Street, New York City, United States of America.

CONTENTS (continued)

	PAGE ENG.	PAGE RUSS.
NEWS OF SCIENCE AND TECHNOLOGY		
Working Conference on Weak Interactions—V. Belyaev	438	423
International Conference on Sector Cyclotrons—A. L.	439	423
A Two Weeks' Visit to British Physicists—S. M. Polikanov and E. S. Lazutkin	442	425
[The Melbourne Energy Conference		427]
BRIEF COMMUNICATIONS	445	428
BIBLIOGRAPHY		
New Literature	446	430

NOTE: The Table of Contents lists all materials that appear in Atomnaya Énergiya. Those items that originated in the English language are not included in the translation and are shown enclosed in brackets. Whenever possible, the English-language source containing the omitted reports will be given.

Consultants Bureau Enterprises, Inc.

ATOMNAYA ÉNERGIYA
EDITORIAL BOARD

A. I. Alikhanov
A. A. Bochvar
N. A. Dollezhal'
K. E. Erglis
V. S. Fursov
I. N. Golovin
V. F. Kalinin
N. A. Kolokol'tsov
(Assistant Editor)
A. K. Krasin
I. F. Kvartskhava
A. V. Lebedinskii
A. I. Leipunskii
M. G. Meshcheryakov
M. D. Millionshchikov
(Editor-in-Chief)
I. I. Novikov
V. B. Shevchenko
A. P. Vinogradov
N. A. Vlasov
(Assistant Editor)
M. V. Yakutovich
A. P. Zefirov

SOVIET ATOMIC ENERGY

A translation of **ATOMNAYA ÉNERGIYA**
A publication of the Academy of Sciences of the USSR

© 1964 CONSULTANTS BUREAU ENTERPRISES, INC.
227 West 17th Street, New York 11, N. Y.

Vol. 14, No. 5 March, 1964

CONTENTS

	PAGE ENG.	PAGE RUSS.
Lenin Prize Winner B. M. Pontecorvo – N. N. Bogolyubov	457	441
An Adiabatic Trap with Combined Magnetic Field – Yu. T. Baiborodov, M. S. Ioffe, V. M. Petrov, and R. I. Sobolev	459	443
Injecting the Ion Beam into the "Ogra" Magnetic Mirror Machine – A. L. Bezbatchenko, V. V. Kuznetsov, N. P. Malakhov, and N. N. Semashko	462	446
Theory of the Passage of γ-Quanta through Matter – V. S. Galishev	469	453
The Differential Equation for the Thermalization of Neutrons in Infinite Homogeneous Media – N. I. Laletin	474	458
Study of Spent Fuel Elements from the First Atomic Electric Station – Sh. Sh. Ibragimov, L. A. Syshchikov, I. M. Voronin, and V. G. Kudryashov	482	465
Note on Determining Irradiation Costs in a Research Reactor – V. A. Tsykanov	486	469
Some Laws of the Formation of Epigenetic Uranium Ores in Sandstones, Derived from Experimental and Radiochemical Data – L. S. Evseeva, K. E. Ivanov, and V. I. Kochetkov	492	474
LETTERS TO THE EDITOR		
Elastic and Inelastic Scattering of α-Particles on Al^{27} – K. P. Artemov, V. Z. Gol'dberg, and V. P. Rudakov	499	482
Formation Cross Sections of Krypton and Xenon Isotopes in the Fission of Uranium by 680 MeV Protons	502	484
Note on the Effect of Neutron Polarization on Neutron Transmission in Media – P. S. Ot-stavnov	506	487
Angular Energy Distribution of Neutrons at an Interface – V. A. Dulin, Yu. A. Kazanskii, and I. V. Shugar	508	488
Slow-Neutron Spectrum in the Horizontal Channel of the VVR-S Reactor – R. V. Begzhanov, D. A. Gladyshev, S. V. Starodubtsev, and T. Khaidarov	511	490
Study of the Sorption Properties of Silica Gel Irradiated with Neutrons – V. V. Gromov and Vikt. I. Spitsyn	513	491
Investigation of Ion Exchange in Hydrofluoric Acid Solutions – Separation of RaD, RaE, and Polonium – M. K. Nikitin and G. S. Katykhin	516	493
The Separation of Oxygen Isotopes by Thermal Diffusion – E. P. Ageev and G. M. Panchenkov	518	494

(continued)

Annual Subscription: $95 **Single Issue: $30** **Single Article: $15**

All rights reserved. No article contained herein may be reproduced for any purpose whatsoever without permission of the publisher. Permission may be obtained from Consultants Bureau Enterprises, Inc., 227 West 17th Street, New York City, United States of America.

CONTENTS (continued)

	PAGE	RUSS. PAGE
Gamma Radiation Spectra of Radioactive Ores in their Natural Strata, Determined by Proportional Counters – B. M. Kolesov, Yu. P. Lyubavin, and A. K. Ovchinnikov	521	496
Gamma Radiation of Elements of the Uranium and Thorium Series in the Low-Energy Range – B. I. Khazanov	525	499
NEWS OF SCIENCE AND TECHNOLOGY		
XIII Session of the Learned Council of the Joint Institute for Nuclear Research – V. Biryukov and R. Lebedev	528	502
Conference on Nuclear Reactions on Light Nuclei – I. V. Sizov	534	505
Conference on Heavy Water Reactors	535	506
Symposium on Neutron Recording, Dosimetry, and Standardization – V. I. Ivanov	536	506
[Powerful Reactor Station in Midtown New York Source: Nucleonics, Jan.-Feb. (1962)		508]
BRIEF COMMUNICATIONS	539	509
Synthesis of a New Isotope of Element 102	540	510
BIBLIOGRAPHY		
New Literature	541	511

NOTE

The Table of Contents lists all materials that appear in Atomnaya Énergiya. Those items that originated in the English language are not included in the translation and are shown enclosed in brackets. Whenever possible, the English-language source containing the omitted reports will be given.

Consultants Bureau Enterprises, Inc.

ATOMNAYA ÉNERGIYA
EDITORIAL BOARD

A. I. Alikhanov
A. A. Bochvar
N. A. Dollezhal'
K. E. Erglis
V. S. Fursov
I. N. Golovin
V. F. Kalinin
N. A. Kolokol'tsov
(Assistant Editor)
A. K. Krasin
I. F. Kvartskhava
A. V. Lebedinskii
A. I. Leipunskii
M. G. Meshcheryakov
M. D. Millionshchikov
(Editor-in-Chief)
I. I. Novikov
V. B. Shevchenko
A. P. Vinogradov
N. A. Vlasov
(Assistant Editor)
M. V. Yakutovich
A. P. Zefirov

SOVIET ATOMIC ENERGY

A translation of **ATOMNAYA ÉNERGIYA**
A publication of the Academy of Sciences of the USSR

© 1964 CONSULTANTS BUREAU ENTERPRISES, INC.
227 West 17th Street, New York 11, N. Y.

Vol. 14, No. 6 May, 1964

CONTENTS

	PAGE ENG.	PAGE RUSS.
The Effect of the Main Parameters of a Cyclotron on the Duration and Phase of an Accelerated Ion Cluster—N. I. Venikov and N. V. Kartashov	551	521
Temperature Dependence of the Diffusion Characteristics of a Moderator—D. A. Kozhevnikov	556	525
An Empirical Formula for the Average Number of Fission Neutrons—L. D. Gordeeva and G. N. Smirenkin	562	530
[Analytical Aspects of Delayed Neutron Emission; S Amiel and M. Peisach, Report No. IA—784, Israel Atomic Energy Commission		535]
The Neutron Yield of Materials under the Effect of Radon α-Particles and Its Decay Products—G. V. Gorshkov, V. A. Zyabkin and O. S. Tsvetkov	567	544
Be, B, C, O, F, Na, Mg, Al and Si Neutron Yields from an (α, n) Reaction under the Effect of Thorium and Uranium α-Particles and Their Decay Products—G. V. Gorshkov and O. S. Tsvetkov	573	550
The Thermal and Radiation Stability of Some Aromatic Compounds—Yu. G. Sevast'yanov, L. A. Bulanov, A. P. Smirnov-Averin, E. P. Kaplan, O. M. Nefedov, M. A. Chel'tsova, and A. D. Petrov	578	555
The Polymorphism of Some Rare Earth Oxides and Their Reaction with Water—K. I. Portnoi, V. I. Fadeeva, and N. I. Timofeeva	582	559
The Reduction of Zirconium Dioxide by Calcium Carbide and Cyanamide—G. A. Meerson, Yu. G. Olesov, and V. I. Pryalochnikov	586	563
Contamination of the Air with Artificial Radioactive Substances over the Atlantic Ocean in 1961—V. N. Lavrenchik, L. N. Samoilov, P. M. Chulkov, V. F. Gorbunov, and N. S. Vel'tishcheva	593	569
LETTERS TO THE EDITOR		
The Problem of Plasma Rotation—E. P. Velikhov	597	573
Comparative Characteristics of the Ternary Fission of Uranium and Plutonium—V. N. Dmitriev, L. V. Drapchinskii, K. A. Petrzhak, and Yu. F. Romanov	599	574
Ternary Fission of U235 by 14-Mev Neutrons—N. A. Perfilov, Z. I. Solov'eva, and R. A. Filov	601	575
The Gamma Radiation Field of Monodirectional Cs^{137} and Co^{60} Point Sources in Iron—O. I. Leipunskii, L. R. Kimel', and A. M. Panchenko	603	577
The Kinetics of a Boiling Homogeneous Reactor—V. K. Zavoiskii	605	579

(continued)

Annual Subscription: $95 **Single Issue: $30** **Single Article: $15**

All rights reserved. No article contained herein may be reproduced for any purpose whatsoever without permission of the publisher. Permission may be obtained from Consultants Bureau Enterprises, Inc., 227 West 17th Street, New York City, United States of America.

CONTENTS (continued)

	PAGE ENG.	RUSS.
Experimental Determination of the Specific Volumes of Heavy Water at High Pressures and Temperatures—S. L. Rivkin and T. S. Akhundov	609	581
Determination of the Cross-Section Self-Shielding Effect with Doppler Broadening of Resonances over the Entire Energy Range—L. P. Abagyan	612	583
Heat Exchange in the Longitudinal Flow of Metallic Sodium Past a Tube Bank V. M. Borishanskii and E. V. Firsova	614	584
The Deposition of Cesium and Rubidium from CO_2 on Various Materials—N. V. Brevnova, L. I. Vartanova, V. I. Polikarpov, and N. N. Yuzvuk	616	585
The Study of Mass Transfer in the Separation of Isotopes by Chemical-Exchange and Distillation Methods—V. A. Kaminskii	617	586
The Relationship Between the Behavior of Boron-Containing Phases during Neutron Irradiation and the Features of Their Crystal Structure—G. V. Samsonov	620	588
NEWS OF SCIENCE AND TECHNOLOGY		
The Fourth All-Union Intercollegiate Conference on the Theory of Elementary Particles—A. L., F. N.	623	591
New Searches for Heavy Isotopes of Hydrogen—N. V.	626	593
A Conference of Experts on Heavy-Water Lattices—P. P. Blagovolin	627	594
International Symposium on Radiation Chemistry—V. M. Patskevich	628	595
A Colloquium on the Design and Use of Betatrons—V. N. Nikeshichev and R. V. Sinitsyn	630	596
All-Union Seminar on Radioisotope Measuring Techniques—Ya. K.	633	597
Czechoslovak Conference on Radiation Safety—Yu. V. Sivintsev	634	598
The Flow Extraction of Scandium from Uranium Ores—B. I. Kogan and V. A. Nazvanova	636	600
Brief Communications	639	602
BIBLIOGRAPHY		
New Literature	641	604

NOTE

The Table of Contents lists all materials that appear in Atomnaya Énergiya. Those items that originated in the English language are not included in the translation and are shown enclosed in brackets. Whenever possible, the English-language source containing the omitted reports will be given.

Consultants Bureau Enterprises, Inc.

ATOMNAYA ÉNERGIYA
EDITORIAL BOARD

A. I. Alikhanov
A. A. Bochvar
N. A. Dollezhal'
K. E. Erglis
V. S. Fursov
I. N. Golovin
V. F. Kalinin
N. A. Kolokol'tsov
(Assistant Editor)
A. K. Krasin
I. F. Kvartskhava
A. V. Lebedinskii
A. I. Leipunskii
M. G. Meshcheryakov
M. D. Millionshchikov
(Editor-in-Chief)
I. I. Novikov
V. B. Shevchenko
A. P. Vinogradov
N. A. Vlasov
(Assistant Editor)
M. V. Yakutovich
A. P. Zefirov

SOVIET ATOMIC ENERGY

A translation of **ATOMNAYA ÉNERGIYA**
A publication of the Academy of Sciences of the USSR

© 1964 CONSULTANTS BUREAU ENTERPRISES, INC.
227 West 17th Street, New York 11, N. Y.

Vol. 15, No. 1 May, 1964

CONTENTS

	PAGE ENG.	PAGE RUSS.
Ion Cyclotron Resonance in a Moving Plasma – I. I. Bakaev, Yu. G. Zalesskii, N. I. Nazarov, A. M. Ukrainskii, and V. T. Tolok	655	3
The Kinetic Energy of Fragments and Alpha Particles in the Ternary Fission of U^{235} – V. N. Dmitriev, K. A. Petrzhak, and Yu. F. Romanov	659	6
Distribution of the Number of Counts on a Neutron Detector Placed in a Reactor – V. G. Zolotukhin and A. I. Mogil'ner	664	11
Attenuation of Pile Neutron Flux in Polyethylene – V. N. Avaev, G. A. Vasil'ev, A. P. Veselkin, Yu. A. Egorov, Yu. V. Orlov, and Yu. V. Pankrat'ev	671	17
Spectra of Fast Pile Neutrons in Passage Through Polyethylene – V. N. Avaev, G. A. Vasil'ev, A. P. Veselkin, Yu. A. Egorov, Yu. V. Orlov, and Yu. V. Pankrat'ev	675	20
The Separation of Zr^{95}, Nb^{95}, and Ru^{106} from a Mixture of Fission Products by Extraction with Tributyl Phosphate – N. E. Brezhneva, V. I. Levin, G. V. Korpusov, E. K. Bogacheva and N. M. Man'ko	678	23
The Effect of Neutron Irradiation on the Structure and Mechanical Properties of Alloy Steels – Sh. Sh. Ibragimov, I. M. Voronin, and A. S. Kruglov	685	30
The Corrosive Effect of Fuel Element Solvents on Structural Materials – M. M. Kurtenov and E. N. Mirolyubov	692	37
Radiation Dosimeters Based on Thermoluminescence Measurements in Aluminum Phosphate Glass (IKS Dosimeters) – I. A. Bochvar, A. A. Vasil'eva, I. B. Keirim-Markus, T. I. Prosina, Z. M. Syritskaya, and V. V. Yakubik	704	48
Monitoring Ionizing Radiations Resulting from Nitrogen Reactions – M. T. Dmitriev	709	52
LETTERS TO THE EDITOR		
Oscillations in a Spatially Nonuniform Plasma in a Magnetic Field – V. G. Davidovskii	717	60
New Ways of Increasing the Efficiency of the Microtron – K. A. Belovintsev, A. Ya. Belyak, V. I. Gridasov, and P. A. Cherenkov	720	62
Fast Neutron Polarization Apparatus – N. V. Alekseev, U. R. Arifkhanov, N. A. Vlasov, V. V. Davydov, and L. N. Samoilov	722	62
The Number of Prompt Neutrons and the Kinetic Energy of Fragments During Low-Energy Fission of U^{235} – Yu. A. Blyumkina, I. I. Bondarenko, V. F. Kuznetsov, V. G. Nesterov, V. N. Okolovich, and G. N. Smirenkin	725	64
The Optimum Condition for Biological Shielding Against a Number of Radiation Sources – G. A. Lisochkin	729	67

(continued)

Annual Subscription: $95 **Single Issue: $30** **Single Article: $15**

All rights reserved. No article contained herein may be reproduced for any purpose whatsoever without permission of the publisher. Permission may be obtained from Consultants Bureau Enterprises, Inc., 227 West 17th Street, New York City, United States of America

CONTENTS (continued)

	PAGE ENG.	PAGE RUSS.
The Structure of the Gamma Radiation Field from an Isotropic Point Source in Aluminum with Barrier Geometry—V. A. Vorob'ev	732	68
The Ratio of the Thermal Neutron Flux in Water to the Power of a Point Source—E. A. Garusov and Yu. V. Petrov	736	71
The Effectiveness of a System of Absorber Rods Arbitrarily Distributed in a Reflected Reactor —V. I. Nosov	737	71
Frequency Analysis in a System which Includes a Runaway Reactor—A. R. Mirzoyan and I. N. Brikker	741	74
Calculation of the Temperature of Regenerative Preheating of Water in Two-Circuit Atomic Power Plants—D. Grecov	744	76
An Investigation of Critical Heat Fluxes During Forced Movement of Monoisopropyl Diphenyl Heated Below the Saturation Temperature—G. N. Karavaev, A. D. Leongardt, and Yu. P. Shlykov	747	77
Determination of the Permeability of Pipe Walls with Respect to Helium—I. S. Lupakov, Yu. S. Kuz'michev, and Yu. V. Zakharov	750	79
The Fluorination of Uranium Sulfate by Chlorine Trifluoride—N. S. Nikolaev and Yu. D. Shishkov	753	81
NEWS OF SCIENCE AND TECHNOLOGY		
XIII All-Union Conference on Nuclear Spectroscopy—V. P. Rudakov	754	82
Geochemical Conference Dedicated to the Centennial of V. I. Vernadskii—A. I. Tugarinov	755	82
New Trends in Research and Applications for Rare Earths—L. Polyakov	758	84
Conference on Nuclear Power Development in the Czechoslovak Socialist Republic —S. Medonos	760	86
Conference of the Plasma Physics Section of the American Physical Society	761	87
Status of the Uranium Industry in the Capitalist Countries as of 1962—V. D. Andreev	763	88
USAEC Delegation Visits the Soviet Union	769	91
BRIEF COMMUNICATIONS	772	93
FROM THE EDITOR		
The Introduction of an International System of Units in the USSR—V. Korotkov	774	96
BIBLIOGRAPHY		
New Literature	779	99
Articles from the Periodical Literature	780	99

ATOMNAYA ÉNERGIYA
EDITORIAL BOARD

A. I. Alikhanov
A. A. Bochvar
N. A. Dollezhal'
K. E. Erglis
V. S. Fursov
I. N. Golovin
V. F. Kalinin
N. A. Kolokol'tsov
(Assistant Editor)
A. K. Krasin
I. F. Kvartskhava
A. V. Lebedinskii
A. I. Leipunskii
M. G. Meshcheryakov
M. D. Millionshchikov
(Editor-in-Chief)
I. I. Novikov
V. B. Shevchenko
A. P. Vinogradov
N. A. Vlasov
(Assistant Editor)
M. V. Yakutovich
A. P. Zefirov

SOVIET ATOMIC ENERGY

A translation of **ATOMNAYA ÉNERGIYA**

A publication of the Academy of Sciences of the USSR

© 1964 CONSULTANTS BUREAU ENTERPRISES, INC.
227 West 17th Street, New York 11, N. Y.

Vol. 15, No. 2 May, 1964

CONTENTS

	PAGE ENG.	PAGE RUSS.
The Theory of Heterogeneous Reactors with Slugs of Finite Radius—A. D. Galanin and B. P. Kochurov	791	107
The Dynamics of Nuclear Power Stations—P. A. Gavrilov and B.N. Seliverstov	802	115
Capture Cross Sections in Construction Materials for Neutrons with Energies up to 50 keV —S. P. Kapchigashev and Yu. P. Popov	808	120
Activation of Various Materials Irradiated by 660 MeV Protons—M. M. Komochkov	815	126
The Chemical Stability and Crystallizability of a Glass Mass as Affected by Composition and Method of Preparation—Yu. N. Golobanov, N. E. Brezhneva, S. N. Oziraner, A. A. Eremin, and V. L. Zotov	820	130
Extraction of Tetravalent Cerium by Organic Solvents—V. I. Levin, G. V. Korpusov, N. M. Man'ko, E. N. Patrusheva, N. P. Prokhorova, and G. F. Platnov	828	138
Calculating the Yield of Photoneutrons from Mixtures of SiO_2 with Small Amounts of Beryllium, Water, Lithium, Carbon, Uranium, and Thorium—A. M. Pargal, A. D. Suvorov, V. A. Shkoda-Ul'yanov, and L. A. Shabalina	836	146
The Radiation Doses Absorbed by the Personnel of the Nuclear Power Plant of the Atomic Icebreaker "Lenin"—V. K. Kovalenko, V. F. Kozlov, Yu. V. Sivintsev, and Yu. I. Smirnov	842	152
LETTERS TO THE EDITOR		
The Optical Theorem and the Energy Spectrum—S. A. Kholin	846	156
Delayed Neutrons from Pu^{239}—B. P. Maksyumenko	848	157
Delayed Neutrons in the Photofission of U^{238}—K. A. Petrzhak, M. Ya. Kontrat'ko, O. P. Nikotin, and V. F. Teplykh	849	157
The Periods of Spontaneous Fission of Pu^{240} and Pu^{242}—L. Z. Malkin, I. D. Alkhazov, A. S. Krivokhatskii, and K. A. Petrzhak	851	158
Nomograms for the Design of Water Shielding Against Neutrons from (α, n)) Sources —E. A. Kramer-Ageev and V. P. Mashkovich	853	160
A Study of the Distribution of Aluminum Hydroxide between Water and Saturated Steam —M. A. Styrikovich, O. I. Martynova, K. A. Katkovskaya, I. Ya. Dubrovskii, and É. I. Mingulina	855	161

(continued)

Annual Subscription: $95 **Single Issue: $30** **Single Article: $15**

All rights reserved. No article contained herein may be reproduced for any purpose whatsoever without permission of the publisher. Permission may be obtained from Consultants Bureau Enterprises, Inc., 227 West 17th Street, New York City, United States of America.

CONTENTS (continued)

	PAGE ENG.	RUSS.
The Density Variation in a Volumetrically Heated Boiling Liquid during a Power Pulse —V. K. Zavoiskii	859	164
Flow Controller with Flow Passages Shaped as a Long Slit—P. P. Ionaitis	862	166
The Stability of Fluoride Complexes of Tetravalent Uranium—V. M. Vdovenko and G.A. Romanov	865	168
The Effect of Internal Irradiation on the Decrement of Attenuation in Zirconium —P. L. Gruzin and A. N. Semenikhin	867	169
NEWS OF SCIENCE AND TECHNOLOGY		
Cern Conference on High Energy Particle Physics and on the Structure of the Nucleus —G. A. Leksin and O. V. Lozhkin	870	172
Antimatter and Cosmology—N. V.	873	174
Symposium on Processing and Burial of High-Level Wastes—B. S. Kolychev	874	175
[Startup of Windscale Power Station		178]
Symposium on Radioisotope Tracer Applications in Hydrology—V. K.	878	180

NOTE

The Table of Contents lists all materials that appear in Atomnaya Énergiya. Those items that originated in the English language are not included in the translation and are shown enclosed in brackets. Whenever possible, the English-language source containing the omitted reports will be given.

Consultants Bureau Enterprises, Inc.

ATOMNAYA ÉNERGIYA
EDITORIAL BOARD

A. I. Alikhanov
A. A. Bochvar
N. A. Dollezhal'
K. E. Erglis
V. S. Fursov
I. N. Golovin
V. F. Kalinin
N. A. Kolokol'tsov
(Assistant Editor)
A. K. Krasin
I. F. Kvartskhava
A. V. Lebedinskii
A. I. Leipunskii
M. G. Meshcheryakov
M. D. Millionshchikov
(Editor-in-Chief)
I. I. Novikov
V. B. Shevchenko
A. P. Vinogradov
N. A. Vlasov
(Assistant Editor)
M. V. Yakutovich
A. P. Zefirov

SOVIET ATOMIC ENERGY

A translation of **ATOMNAYA ÉNERGIYA**

A publication of the Academy of Sciences of the USSR

© 1964 CONSULTANTS BUREAU ENTERPRISES, INC.
227 West 17th Street, New York 11, N. Y.

Vol. 15, No. 3 September, 1963

CONTENTS

	PAGE ENG.	PAGE RUSS.
Kinetic Energy and Angular Distribution of the Fragments from Neutron and Photon Fission of U^{238} – B. A. Bochagov, A. P. Komar, V. I. Fadeev	891	191
Calculation of the Pulse Height Distribution and Counting Efficiency of a Fast Neutron Scintillation Detector – V. G. Zolotukhin, G. G. Doroshenko, and B. A. Efimenko	895	194
A Study of Thermal Neutron Sources – R. D. Vasil'ev, G. A. Dorofeev, G. S. Mordovskaya, V. I. Petrov, and M. I. Pimenov	902	200
Free Particle Oscillation Frequency in an Isochronous Cyclotron as Affected by Space Charge – A. A. Glazov, V. P. Dzhelepov, V. P. Dmitrievskii, B. I. Zamolodchikov, V. V. Kol'ga, A. A. Kropin, L. M. Onishchenko, and E. Shvabe	906	205
The Thermodynamic Properties of Carbon Dioxide at Temperatures of 0-1000°C and Pressures up to 100 Bars – M. P. Vukalovich, V. V. Altunin, and N. I. Timoshenko	912	210
Contamination of the Steam in Boiling Reactors from Solution of Water Impurities – M. A. Styrikovich and O. I. Martynova	917	214
An Investigation of the Volatilization Mechanism of Ruthenium, Coprecipitated with Different Substances, at High Temperatures – Yu. N. Golovanov, N. E. Brezhneva, S. N. Oziraner, A. A. Eremin, and V. L. Sotov	922	219
Multicomponent Radiometric Analysis of Rock Samples by Means of an LSU-5 (Laura) Scintillation Apparatus – A. L. Yakubovich, E. I. Zaitsev and V. V. Anosov	928	224
The Trapping of Short Lived Radon Daughter Products by FP Fibrous Filters – B. I. Ogorodnikov, V. N. Kirichenko, P. I. Basmanov, and I. V. Petryanov	935	230
Hot Aerosol Particles in the Atmosphere – S. G. Malakhov, K. P. Makhon'ko	942	238
Study of the Correlation between the Mass Distribution of Fission Fragments and the Quantum Characteristics of a Nucleus at a Saddle Point – P. P. D'yachenko, B. D. Kuz'minov, L. S. Kutsaeva, A. I. Sergachev, and A. N. Utyuzhnikov	950	246
Resonance Levels of Erbium Isotopes – M. F. Vlasov, V. P. Vertebnyi, and A. L. Kirilyuk	952	247
The Energy Distribution of Cm^{244} Spontaneous-Fission Fragments – L. Z. Malkin, I. D. Alkhazov, A. S. Krivokhatskii, D. A. Petrzhak, and L. M. Belov	955	249

(continued)

Annual Subscription: $95 **Single Issue: $30** **Single Article: $15**

All rights reserved. No article contained herein may be reproduced for any purpose whatsoever without permission of the publisher. Permission may be obtained from Consultants Bureau Enterprises, Inc., 227 West 17th Street, New York City, United States of America.

CONTENTS (continued)

	PAGE ENG.	PAGE RUSS.
Channeling Effects in the Energy Dependence of the Average Kinetic Energy of U^{233} Fission Fragments – V. N. Okolovich and G. N. Smirenkin	956	250
Calculation of the Penetration of Neutrons Through a Plane Layer of Polyethylene – S. M. Ermakov, V. G. Zolotukhin, and É. E. Petrov	960	253
Relaxation of the Temperature of a Neutron Gas – E. Ya. Doil'nitsyn, A. G. Novikov, I. P. Stakhanov, and A. S. Stepanov	963	255
Fuel Element Based on Teflon-4 for Critical Assemblies – N. N. Ponomarev-Stepnoi, S. S. Lomakin, and Yu. G. Degal'tsev	968	259
High Temperature Volatilization Mechanism of Cesium Coprecipitated with the Double Ferrocyanide of Nickel and Potassium – Yu. N. Golovanov, N. E. Brezhnev, S. N. Oziraner, A. A. Eremin, and V. L. Zomov	970	261
The Presence of α-Radiating Hot Aerosol Particles in the Atmosphere – B. I. Styro, Ch. A. Garbalyauskas, V. P. Matulevichus, V. Yu. Potsyus, and K. K. Shopauskas	972	262
Radioactive Fallout in Crimea, 1960-1961 – L. I. Belyaev, L. I. Gedeonov, Z. G. Gritchenko, A. M. Maksimova, V. P. Shvedov, G. V. Yakovleva	974	264
NEWS OF SCIENCE AND TECHNOLOGY		
Seminar on Refractory Metals, Refractory Compounds, and Refractory Alloys – O. S.	977	266
Conference on the Use of Research Reactors in Chemical Research – An. N. Nesmeyanov	979	267
Symposium on Siting of Nuclear Reactors and Research Centers – V. K.	980	268
International Scientific and Technical Conference on Labeled Compounds – V. Bochkarev	982	269
The Outlook for Swedish Power Development till 1980 – Yu. K.	984	271
Survey of International Rules and Regulations on Shipping of Radioactive Materials – N. I. Leschinskii	985	272
BIBLIOGRAPHY		
New Literature	987	278
Articles from the Periodical Literature	988	275

ATOMNAYA ÉNERGIYA
EDITORIAL BOARD

A. I. Alikhanov
A. A. Bochvar
N. A. Dollezhal'
K. E. Erglis
V. S. Fursov
I. N. Golovin
V. F. Kalinin
N. A. Kolokol'tsov
(Assistant Editor)
A. K. Krasin
I. F. Kvartskhava
A. V. Lebedinskii
A. I. Leipunskii
M. G. Meshcheryakov
M. D. Millionshchikov
(Editor-in-Chief)
I. I. Novikov
V. B. Shevchenko
A. P. Vinogradov
N. A. Vlasov
(Assistant Editor)
M. V. Yakutovich
A. P. Zefirov

SOVIET ATOMIC ENERGY

A translation of **ATOMNAYA ÉNERGIYA**

A publication of the Academy of Sciences of the USSR

© 1964 CONSULTANTS BUREAU ENTERPRISES, INC.
227 West 17th Street, New York 11, N. Y.

Vol. 15, No. 4 October, 1963

CONTENTS

	PAGE ENG.	PAGE RUSS.
The Use of High Frequency Electromagnetic Fields to Contain and Stabilize a Plasma—S. M. Osovets	997	283
Calculation of the Thermodynamic Properties of Cesium Vapor up to 1500° K and a Pressure of 22 bars—N. I. Agapova, B. L. Paskar' and L. R. Fokin	1007	292
Enlarged Radiochemical Equipment Using the Radiation from Spent Nuclear Reactor Fuel Elements—V. L. Karpov, A. Kh. Breger, M. E. Eroshov, V. E. Drozdov, G. N. Lisov, S. G. Stoenko, D. M. Torgovitskii, B. I. Vainshtein and N. P. Syrkus	1018	302
A Radiochemical Investigation of the Yields of Rare-Earth Elements from U^{238} Photofission—K. A. Petrzhak and R. V. Sedletskii	1025	308
The Effect of the Iron Minerals in Ores on Oxidation of Uranium in Acid—G. M. Alkhazashvili, G. M. Nesmeyanova and L. N. Kuz'mina	1031	313
LETTERS TO THE EDITOR		
Study of the Motion of Individual Charged Particles in Corrugated Magnetic Fields—V. M. Balebanov, V. B. Glasko, A. L. Groshev, V. V. Kuznetsov, A. G. Sveshnikov and N. N. Semashko	1036	318
The Over-All Kinetic Energy of U^{233} and Th^{232} Fragments—S. S. Kovalenko, K. A. Petrzhak and V. M. Adamov	1039	320
Delayed Neutrons from Fission of U^{233} by 15-MeV Neutrons—B. P. Maksyutenko	1042	321
Determination of the Partial Alpha-Decay Period of Pu^{241}—R. B. Ivanov, A. S. Krivokhatskii, L. M. Krizhanskii, V. G. Nedovesov and M. I. Yakunin	1043	322
The Fast-Neutron Capture Cross Sections of Copper and Zirconium—Yu. Ya. Stavisskii and A. V. Shapar'	1045	323
Use of Large Area Semiconducting Detectors in α-Spectrometry—V. F. Kushniruk, É. Z. Ryndina, S. M. Solov'ev and I. I. Chuburkova	1047	324
The Attenuation of a High-Energy Neutron Flux in Shielding—M. M. Komochkov and B. S. Sychev	1049	325
The Effect of Reflectors Made of Various Materials on the Increase in the Number of Neutron Captures in the Uranium Carbide Blanket of a Fast Reactor—V. I. Golubev, A. V. Zvonarev, M. N. Nikolaev and M. Yu. Orlov	1053	327
Calculation of the Spectral and Angular Distribution of Scattered γ-Quanta from a Point Monodirectional Cs^{137} Source in Iron—L. R. Kimel', A. M. Panchenko and V. P. Terent'ev	1055	328

(continued)

Annual Subscription: $95 **Single Issue: $30** **Single Article: $15**

All rights reserved. No article contained herein may be reproduced for any purpose whatsoever without permission of the publisher. Permission may be obtained from Consultants Bureau Enterprises, Inc., 227 West 17th Street, New York City, United States of America.

CONTENTS (continued)

	PAGE ENG.	PAGE RUSS.
The Effect of Shield Shape on the Attenuation of γ-Rays from Volume Sources—D. P. Osanov	1059	331
Measurement of the Frequency Characteristics of an IRT-1000 Reactor by the Oscillation Method—L. V. Konstantinov, A. I. Efanov and V. V. Postnikov	1060	332
Photoneutron Method for Beryllium Determination in the Laboratory—V. N. Smirnov and D. V. Tokareva	1063	334
Displacement of Uranium from Chloride Melts by Zinc—I. F. Nichkov, S. P. Rasponin and A. F. Tsarenko	1066	336
A New Type of Porous Bed Model for Neutron Logging—N. K. Kukharenko, Ya. N. Basin, Yu. P. Bal'vas and Yu. V. Tyukaev	1069	338
Secondary Dust Component of Radioactive Contamination in the Surface Layer of the Atmosphere—B. I. Styro, Ch. A. Garbalyauskas, V. I. Luyanas, V. P. Matulyavichus, T. N. Nedvetskaite and I. S. Tomkus	1072	339
NEWS OF SCIENCE AND TECHNOLOGY		
Conference on Electrostatic Generators and Direct-Voltage Accelerators—G. M. Osetinskii	1075	342
International Conference on Sector-Focused Cyclotrons and Meson Factories—P. Lapostol	1078	343
IAEA Symposium on Thermodynamics of Nuclear Materials—V. V. Akhachinskii	1082	346
The Use of Gamma-Ray Sources in Nondestructive Testing at the Csepel Metallurgical Combine (Hungary)—E. Fényvésy, K. Scserbak and K. Vara	1090	351
BIBLIOGRAPHY		
New Literature	1093	354

ATOMNAYA ÉNERGIYA
EDITORIAL BOARD

A. I. Alikhanov
A. A. Bochvar
N. A. Dollezhal'
K. E. Erglis
V. S. Fursov
I. N. Golovin
V. F. Kalinin
N. A. Kolokol'tsov
(Assistant Editor)
A. K. Krasin
I. F. Kvartskhava
A. V. Lebedinskii
A. I. Leipunskii
M. G. Meshcheryakov
M. D. Millionshchikov
(Editor-in-Chief)
I. I. Novikov
V. B. Shevchenko
A. P. Vinogradov
N. A. Vlasov
(Assistant Editor)
M. V. Yakutovich
A. P. Zefirov

SOVIET ATOMIC ENERGY

A translation of **ATOMNAYA ÉNERGIYA**
A publication of the Academy of Sciences of the USSR

© 1964 CONSULTANTS BUREAU ENTERPRISES, INC.
227 West 17th Street, New York 11, N. Y.

Vol. 15, No. 5 November, 1963

CONTENTS

	PAGE ENG.	PAGE RUSS.
The Effect of a Strong Magnetic Field on the Magnetohydrodynamic Stability of Plasma and the Containment of Charged Particles in the "Tokamak"—E. P. Gorbunov and K. A. Razumova	1105	363
Methods for the Calculation of the Radiational Thermal Output in the Body and Shielding of a Nuclear Reactor—D. L. Broder and K. K. Popkov	1113	370
Measurement of the Thermal Neutron Density Distribution Along the Radius of Sleeve-Shaped Fuel Elements—V. F. Belkin, B. P. Kochurov, and O. V. Shvedov	1121	377
Calculation of γ-Ray Energy Absorption in Heterogeneous Macro-Systems—B. M. Terent'ev, V. A. Él'tekov, and D. I. Golenko	1127	382
Measurement of Neutron Tissue Dose Outside Reactor Shielding—I. B. Keirim-Markus, V. T. Korneev, V. V. Markelov, and L. N. Uspenskii	1132	386
Kinetics of the Swelling Produced in Fissionable Materials by the Separation of the Gaseous Phase from a Supersaturated Solid Solution—V. M. Agranovich, E. Ya. Mikhlin, and L. P. Semenov	1140	393
Theory of the Coalescence of Gaseous Pores Under Swelling Conditions—L. P. Semenov	1155	404
LETTERS TO THE EDITOR		
The Motion of Isolated Charged Particles in a Magnetic Field with Helical Symmetry—V. M. Balebanov, B. I. Volkov, V. B. Glasko, A. L. Groshev, V. V. Kuznetsov, A. G. Sveshnikov, and N. N. Semashko	1162	409
Inelastic Scattering of 14-MeV Neutrons by Light Nuclei—E. M. Oparin, A. I. Saukov, and R. S. Shuvalov	1165	411
On the Design of a Neutron Spin Rotator—Yu. V. Taran	1168	413
Measurement of the U^{238} and Th^{232} Capture Cross Sections for Neutrons with Energies of 5-200 keV—V. A. Tolstikov, L. E. Sherman, and Yu. Ya. Stavisskii	1170	414
Cross Sections of the Inelastic Scattering of Neutrons with Energies of 0.4–1.2 MeV on Medium and Light Nuclei—N. P. Glazkov	1173	416
Dependence of the Mean Kinetic Energy of Fragments on the Fissionable Nucleus Mass—V. N. Okolovich, V. I. Bol'shov, L. D. Gordeeva, and G. N. Smirenkin	1177	419
Energy Distribution of γ-Radiation in a Material Medium—A. M. Sazonov and V. I. Sirvidas	1179	420
Obtaining the Radioactive Isotope Be^7 from Cyclotron Targets—I. F. Kolosova and I. V. Kolosov	1182	422
The Solubility of Uranium Tetrafluoride in Aqueous Solutions of Acids—Yu. A. Luk'yanychev and N. S. Nikolaev	1184	423

(continued)

Annual Subscription: $95 **Single Issue: $30** **Single Article: $15**

All rights reserved. No article contained herein may be reproduced for any purpose whatsoever without permission of the publisher. Permission may be obtained from Consultants Bureau Enterprises, Inc., 227 West 17th Street, New York City, United States of America.

CONTENTS (continued)

	PAGE ENG.	PAGE RUSS.
An Apparatus for Determining the Solubility of Radioactive Substances at Elevated Temperatures and Pressures—V. V. Ivanenko, G. N. Kolodin, B. N. Melent'ev, and L. A. Pamfilova. . . .	1188	426
The Preparation of Certain Sulfides of Thorium by the Interaction of ThO_2 with Hydrogen Sulfide—G. V. Samsonov and G. D. Dubrovskaya	1191	428
Estimation of the Dose of Neutron Irradiation Capable of Changing the Mechanical Properties of Pure Metals—V. K. Adamovich	1194	430
Aerial Surveys of Uranium Deposits in Wooded Regions—V. I. Balabanov and A. L. Kovalevskii.	1197	432
NEWS OF SCIENCE AND TECHNOLOGY		
Conference on Reactions of Complex Nuclei—S. M. Polikanov.	1201	435
Conference on Interactions of High-Energy Photons—B. B. Govorkov and A. I. Lebedev	1202	436
The Second European "Vakuum" Symposium—E. Fischer	1206	438
Modernization of the VVR-S Reactor	1209	439
Brief Communications	1213	442
Commissioning of the World's First Reactor Power Station with an Organic-Moderator and Organic-Coolant Reactor—Yu. Arkhangel'skii and I. Kovalev.	1215	443
BIBLIOGRAPHY	1216	444

ATOMNAYA ÉNERGIYA
EDITORIAL BOARD

A. I. Alikhanov
A. A. Bochvar
N. A. Dollezhal'
K. E. Erglis
V. S. Fursov
I. N. Golovin
V. F. Kalinin
N. A. Kolokol'tsov
(Assistant Editor)
A. K. Krasin
I. F. Kvartskhava
A. V. Lebedinskii
A. I. Leipunskii
M. G. Meshcheryakov
M. D. Millionshchikov
(Editor-in-Chief)
I. I. Novikov
V. B. Shevchenko
A. P. Vinogradov
N. A. Vlasov
(Assistant Editor)
M. V. Yakutovich
A. P. Zefirov

SOVIET ATOMIC ENERGY

A translation of **ATOMNAYA ÉNERGIYA**
A publication of the Academy of Sciences of the USSR

© 1964 CONSULTANTS BUREAU ENTERPRISES, INC.
227 West 17th Street, New York 11, N. Y.

Vol. 15, No. 6 December, 1963

CONTENTS

	PAGE ENG.	PAGE RUSS.
Aleksandr Il'ich Leipunskii (On His Sixtieth Birthday)	1227	i
Anomalous Diffusion and Stability Theory for a Non-Uniform Plasma—A. A. Galeev, S. S. Moiseev, and R. Z. Sagdeev	1229	451
Measurement of Beam Aperture in the Accelerator Chamber Without Destroying the Beam—I. P. Karabekov	1249	467
Perturbation Theory for the Breeding Factor, and Other Ratios of a Number of Different Processes in a Reactor—L. N. Usachev	1255	472
Measurement of the Slow Neutron Spectrum in a Physical Mock up of the Reactor in the I. V. Kurchatov Beloyarskoe GR Power Station—Yu. Yu. Glazkov, B. G. Dubovskii, G. A. Ilyasova, V. I. Kozlov, V. V. Smelov, and V. N. Sharapov	1266	481
Fission Neutron Breeding in Beryllium—I. F. Zhezherun, I. P. Sadikov, V. A. Taraban'ko, and A. A. Chernyshov	1271	485
A Photoneutron Laboratory for Work With High-Level Sources—Yu. Ya. Stavisskii, A. I. Abramov, T. S. Belanova, A. A. Van'kov, and V. P. Koroleva	1276	489
Measurement of the Resonance Structure Parameters of the Total Cross Sections of Some Elements in the Neutron Energy Range 0.3-2.7 MeV—M. N. Nikolaev and V. V. Filippov	1281	493
Problems in the Radiation Protection of Human Beings in Cosmic Space—E. S. Matusevich and S. G. Tsypin	1287	499
LETTERS TO THE EDITOR		
Multiplication of Fission Neutrons in Beryllium Oxide—I. F. Zhezherun	1294	505
The Relation Between the Back-Scattering Factor of β-Radiation and β-Particle Yield from a Thick-Layer Source and the Atomic Number of a Substance—F. K. Levochkin and Yu. Ya. Sokolov	1297	506
A Note on Calculating Multiple Scattering of Gammas from Planar Sources—F. A. Makhlis	1300	508
Radiation Characteristics of Sm^{145} and Enriched-Se^{75} Gamma Sources—S. V. Rumyantsev, V. A. Dobromyslov, A. S. Shtan', and E. E. Kulish	1303	511
Procedures Followed in the Choice of Isotopes for a Gamma Relay—M. L. Gol'din	1308	514
Dependence of the Heat Release on the Composition of an Iron-Water Thermal Shield—K. K. Popkov, L. N. Tabolina, and S. A. Tsvetkova	1311	516
Thermal Conductivity of Beryllium Oxide in the 1000-2000°C Range—A. G. Kharlamov	1313	517
The Cerimolybdate Method for the Determination of Radiocesium—Vikt. I. Spitsyn, E. A. Torchenkova, and G. G. Stepanova	1316	519

(continued)

Annual Subscription: $95 **Single Issue: $30** **Single Article: $15**

All rights reserved. No article contained herein may be reproduced for any purpose whatsoever without permission of the publisher. Permission may be obtained from Consultants Bureau Enterprises, Inc., 227 West 17th Street, New York City, United States of America.

CONTENTS (continued)

	PAGE ENG.	PAGE RUSS.
The Activation of Catalysts by Neutron Bombardment—Vikt. I. Spitsyn, I. E. Mikhailenko, and G. N. Pirogova	1318	520
The Combined Action of a Surface-Active Melt and Irradiation on Zinc Single Crystals —O. A. Troitskii and V. I. Likhtman	1321	523
A Ferrosulfate Method of Dosimetry in Metal Vessels—V. P. Trusova and Yu. S. Ryabukhin	1325	526
NEWS OF SCIENCE AND TECHNOLOGY		
Agenda of the Third International Geneva Conference on the Peaceful Uses of Atomic Energy —V. I. Kotov and B. N. Yablokov	1326	527
XIV Session of the Learned Council of the Dubna Joint Institute for Nuclear Research —V. Biryukov and R. Lebedev	1332	530
Scientific Conference of the Moscow Engineering and Physics Institute (MIFI)—V. V. Frolov	1336	533
Conference on Techniques for Concentrating Elements in Analytical Chemistry—A. A. Pozdnyakov and É. V. Rakovskii	1339	534
Brief Communications—A. G. Alekseev	1342	536
BIBLIOGRAPHY		
New Literature	1345	538
Author Index, 1963	1357	
Tables of Contents	1361	